

# 304-1



## 250-300°F (121-149°C) Cure Epoxy Resin System

### Typical applications

Sporting goods  
Marine  
Medical  
Industrial manufacturing

### Out life

30 days at 70°F (21°C)

### Shelf life

6 months at 40°F (4°C)  
12 months at 0°F (-18°C)

### Description

304-1 is a 250°F (121°C) to 300°F (149°C) cure, highly toughened, controlled flow epoxy resin system. Versatile processing, excellent mechanical properties, and long out time make 304-1 suitable for a variety of applications where strength and toughness are required.

### Benefits/features

- High toughness
- High impact resistance
- Controlled flow
- Moderate tack

### Application

304-1 can be supplied with most commercially available fibers (carbon, quartz, aramid, S-glass, E-glass, etc.) in both woven form (designated as NB) as well as unidirectional tape (designated as NCT).

Woven fabrics are available in standard commercial widths up to 60 inches (1.5 m). Unitape widths up to 39 inches (1 m) are available in standard fiber weights ranging from 70 – 300 gsm (0.014 – 0.060 psf).

### Recommended processing conditions

304-1 can be cured at temperatures from 250-300°F (121-149°C) depending on part size and complexity. Low, medium, and high pressure molding techniques may be used to cure 304-1. Recommended cure cycle is 50 psi (345kPa), 3°F (1.7°C)/min ramp to 275°F (135°C), hold for 60 minutes, cool to <140°F (60°C).



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CARBON FIBER AND COMPOSITES

Technical Data Sheet



## Neat resin [values are average and do not constitute a specification]

Property	Value
Gel time @ 275°F (135°C), minutes	3 – 5
Specific gravity	1.20
T <sub>g</sub> (DMA, E'), °C (°F)	120 (248)

## Mechanical data [values are average and do not constitute a specification]

3K PW Carbon fabric, press cure, 50 psi, 1 hour at 275°F, results as tested

Property	Test method	RT	160°F (71°C)	200°F (93°C)	RT wet*	160°F (71°C) wet*
0° Tensile strength, ksi (MPa)		85 (586)	78 (538)	75 (517)	78 (540)	71 (490)
0° Tensile modulus, Msi (GPa)	ASTM D638 Type I	9.0 (62)	8.9 (61)	8.8 (61)	8.9 (61)	8.2 (57)
Strain, $\mu$ in/in		9800	8800	8500	--	--
0° Compressive strength, ksi (MPa)	SACMA 1R-94	68 (1570)	56 (386)	54 (372)	55 (379)	38 (262)
0° Compressive modulus, Msi (GPa)		8.0 (142)	7.4 (51)	7.1 (49)	7.3 (50)	7.0 (48)
0° Flexural strength, ksi (MPa)	ASTM D790	115 (793)	99 (683)	82 (565)	100 (689)	69 (476)
0° Flexural modulus, Msi (GPa)		7.4 (51)	7.1 (49)	6.9 (48)	7.3 (50)	6.1 (42)
Short beam shear strength, ksi (MPa)	SACMA 8R-94	9.3 (64)	6.7 (46)	5.9 (41)	6.7 (46)	4.0 (28)

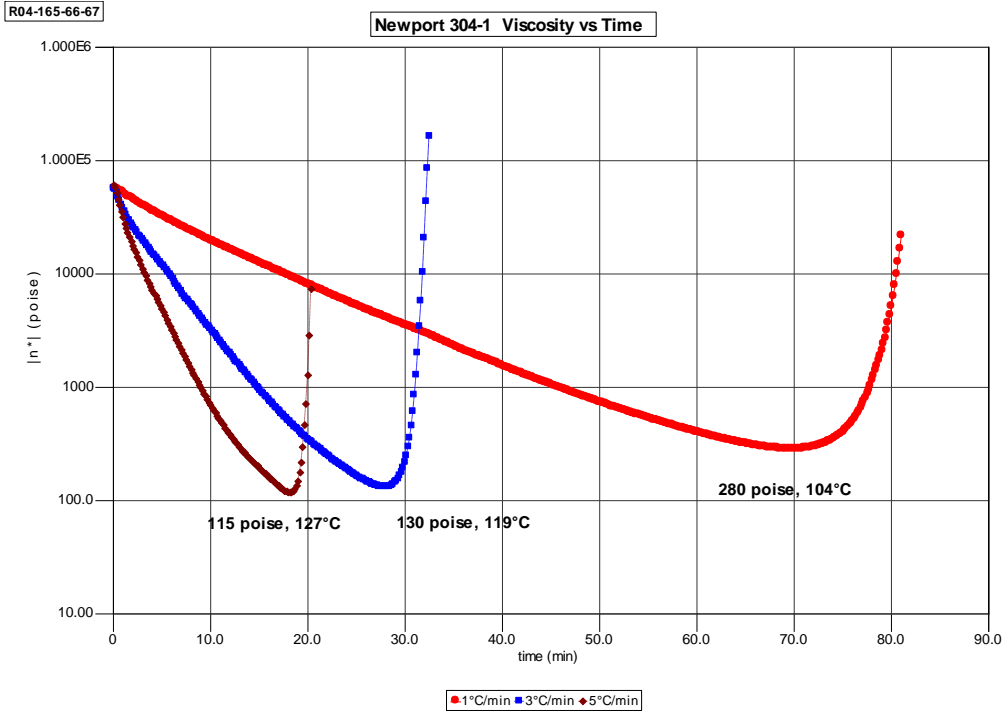
\*Wet = 14-day water immersion at 160°F

Standard modulus carbon fiber, 42%RC, press cure, 50 psi, 60min. at 275°F, results as tested

Property	Test method	RT	160°F (71°C)	200°F (93°C)
0° Tensile strength, ksi (MPa)		289 (1990)	277 (1910)	--
0° Tensile modulus, Msi (GPa)	ASTM D3039	18.7 (129)	17.8 (123)	--
90° Tensile modulus, Msi (GPa)		0.303 (2.1)	--	--
0° Compressive strength, ksi (MPa)	ASTM D695mod	138 (951)	117 (807)	97 (669)
0° Compressive modulus, Msi (GPa)		18.0 (124)	16.4 (113)	15.7 (108)
0° Flexural strength, ksi (MPa)	ASTM D790	282 (1940)	212 (1460)	172 (1190)
0° Flexural modulus, Msi (GPa)		18.0 (124)	17.1 (118)	16.0 (110)
Short beam shear strength, ksi (MPa)	ASTM D2344	13.2 (91)	12.0 (83)	9.4 (65)

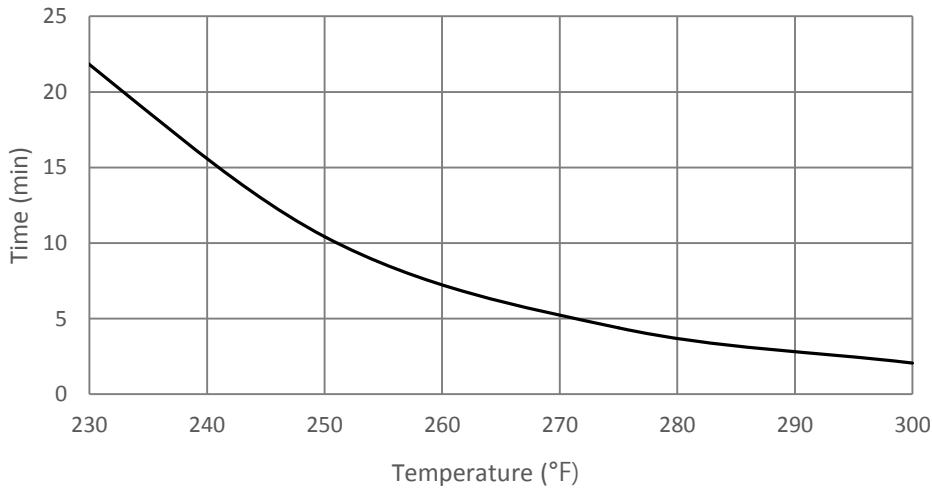
# Viscosity profile

TA - AR2000 parallel plate rheometer



# Gel curve

Gel time vs temperature



The information contained herein has been obtained under controlled laboratory conditions and are typical or average values and do not constitute a specification, guarantee, or warranty. Results may vary under different processing conditions or in combination with other materials. The data is believed to be reliable but all suggestions or recommendations for use are made without guarantee. You should thoroughly and independently evaluate materials for your planned application and determine suitability under your own processing conditions before commercialization. Furthermore, no suggestion for use or material supplied shall be considered a recommendation or inducement to violate any law or infringe any patent.

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